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(71) Applicants (for all designated States except US): TELECOM ITALIA S.p.A. [IT/IT]; Piazza degli Affari, 2, I-20123 Milano (IT). STMICROELECTRONICS S.R.L. [IT/IT]; Via C. Olivetti, 2, I-20041 Agrate Brianza (MI) (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ETTORRE, Donato [IT/IT]; c/o Telecom Italia S.p.A., Via G. Reiss Romoli, 274, I-10148 Torino (IT). GRAZIANO, Maurizio [IT/IT]; c/o Telecom Italia S.p.A., Via G. Reiss Romoli, 274, I-10148 Torino (IT). MELIS, Bruno [IT/IT]; c/o Telecom Italia S.p.A., Via G. Reiss Romoli, 274, I-10148 Torino (IT). FINOTELLO, Andrea [IT/IT]; c/o Telecom

Italia S.p.A., Via G. Reiss Romoli, 274, I-10148 Torino (IT). RUSCITTO, Alfredo [IT/IT]; c/o Telecom Italia S.p.A., Via G. Reiss Romoli, 274, I-10148 Torino (IT).

(74) Agents: GIANNESI, Pier, Giovanni et al.; Pirelli S.p.A., Viale Sarca, 222, I-20126 Milano (IT).

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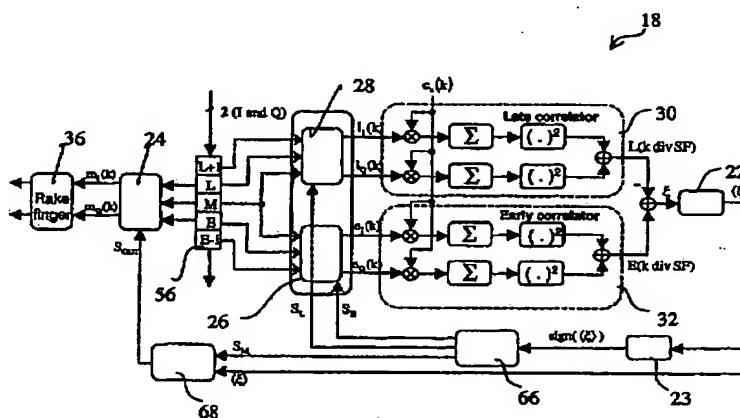
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(54) Title: EARLY-LATE SYNCHRONIZER HAVING REDUCED TIMING JITTER



(57) Abstract: A device for maintaining fine alignment between an incoming spread spectrum signal and a locally generated code in a digital communication receiver comprises: - a delay line (56) for storing a plurality of consecutive samples (E-1, E, M, L, L+1) of the incoming spread spectrum signal; - three digitally controlled interpolators (24, 26, 28) for determining by interpolation between consecutive samples an interpolated early sample (e), an interpolated middle sample (m) and an interpolated late sample (l); - two correlators (30, 32) for calculating an error signal ( $\xi$ ) as the difference between the energy of the symbols computed from the interpolated early (e) and late (l) samples; - a circuit for generating a control signal ( $S_{OUT}$ ) for controlling the interpolation phase of the digitally controlled interpolator (24) for the early sample (e), and - a digital non-linear filter (68), for smoothing the control signal ( $S_{OUT}$ ) of the interpolator (24) for the early sample (e), enabling the update operation of the control signal only when the absolute value ( $|\xi(n)|$ ) of the error signal at a time instant n is smaller than the absolute value ( $|\xi(n-1)|$ ) of the same error signal at a time instant n-1.

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